IS 548-2-20 (1983): Methods of Sampling and Tests for Oils and Fats, Part 2: Purity Tests, Section 20: Test for Detection of TARAMIRA Oil in Mustard/Rapeseed Oil [FAD 13: Oils and Oilseeds]

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IS : 548 (Part 2/Sec 20) - 1983
(Reaffirmed 2000)
2010

Indian Standard

METHODS OF SAMPLING AND TESTS FOR OILS AND FATS

PART 2 PURITY TESTS

Section 20 Test for Detection of *TARAMIRA* Oil in Mustard/ Rapeseed Oil

(First Reprint FEBRUARY 1993)

UDC 665.334.83+665.334.94:543.869

BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

Gr 2

November 1983

Indian Standard

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Indian Standard

METHODS OF SAMPLING AND TESTS FOR OILS AND FATS

PART 2 PURITY TESTS

Section 20 Test for Detection of *TARAMIRA* Oil in Mustard/ Rapeseed Oil

0. FOREWORD

0.1 This Indian Standard (Part 2/Section 20) was adopted by the Indian Standards Institution on 16 August 1983, after the draft finalized by the Oils and Oilseeds Sectional Committee had been approved by the Chemical Division Council and the Agricultural and Food Products Division Council.

0.2 Methods of sampling and tests for oils and fats (IS : 548) was first published in 1954 and subsequently revised in 1964 as Part 1 and it covered methods of sampling, physical, chemical and qualitative tests.

0.2.1 In view of periodical review of qualitative tests for detection of adulteration in oils and fats, the concerned Sectional Committee decided to cover such tests in Part 2 of this standard and IS : 548 (Part 2)-1976* was accordingly published.

0.2.2 The Sectional Committee felt that additional purity tests should be covered in the form of separate test methods and should not be added as amendments to the standard (that is Part 2) since it would create confusion. The tests covered under various Sections of IS : 548 (Part 2)-1976 are as follows:

Section 6 Test for the presence of sesame oil (modified Baudouin test);

Section 7 Test for the presence of cottonseed oil (Halphen test);

Section 8 Test for the presence of linseed oil (Hexabromide test);

Section 9 Test for the presence of *Karanja* (*pungam*) oil and other oils containing phenolic substances;

Section 10 Test for the presence of argemone oil by paper chromatographic method;

*Methods of sampling and tests for oils and fats: Part 2 Purity tests.

Section 11 Test for the presence of hydrocyanic acid;

Section 12 Test for the presence of mineral oil;

Section 13 Test for the presence of ground nut oil [Bellier turbidity temperature test (Acetic acid method)];

Section 14 Test for the presence of *Kusum* oil and other oils containing cyanogenic compounds;

Section 15 Test for the presence of castor oil;

Section 16 Test for the presence of *Neem* oil;

Section 17 Test for the presence of other oils in castor oil;

Section 18 Test for the presence of animal fat in vegetable oil (phytosterol acetate melting point test); and

Section 19 Test for the presence of oil soluble colours.

0.3 In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960*.

1. SCOPE

1.1 This standard (Part 2 /Section 20) prescribes the method of test for detection of *TARAMIRA* oil in mustard/rapeseed oil.

2. OUTLINE OF THE METHOD

2.1 The method involves the isolation of total volatile oil by steam distillation process, its extraction with ethyl ether, concentration and spotting on TLC plates are developed in suitable solvent system and sprayed with ammoniacal silver nitrate. Specific spots due to *TARAMIRA* oil appear in addition to the spots due to allyl-isothiocyanate which is also present in mustard rapeseed oil.

3. APPARATUS

3.1 Distillation Flask — 1-litre, and accessories for the purpose of distillation.

3.2 Steam Generator

3.3 Measuring Flask — 250-ml.

3.4 Conical Flask —100-ml.

3.5 Separating Funnel — 500-ml.

*Rules for rounding off numerical values (*revised*).

3.6 Sprayer with Rubber Bulb

3.7 TLC Plates — 20 × 10 cm and a suitable developing chamber.

3.8 TLC Applicator — with measuring blades.

3.9 Porcelain Dishes — 50-ml each.

4. REAGENTS

4.1 Silver Nitrate Solution — 25 percent in water.

4.2 Ammoniacal Silver Nitrate Solution — 2·5 ml of the 25 percent silver nitrate solution (*see* **4.1**) is made up to 100 ml with liquor ammonia. This solution is to be used as a spraying agents.

4.3 Silica Gel — of suitable grade* with calcium sulphate as binder.

4.4 Benzene

4.5 Absolute Alcohol

4.6 Liquor Ammonia — relative density 0·88.

4.7 Solvent Ether

4.8 Solvent System — Benzene : absolute alcohol (94 : 6).

5. PREPARATION OF TLC PLATES

5.1 Suitable amount of silica gel at the rate of 5 g per plate is mixed well with its double amount of water in a conical flask for 30 seconds. The thickness of the applicator is preadjusted at about 400 μm. The plates are coated as usual and allowed to dry under fan. The plates are then dried/activated at 105°C for one hour before use.

6. PROCEDURE

6.1 Take 5 ml of oil into a distillation flask and add about 200 ml of water to it. Connect with flask to the steam generator and distil the total volatile oil. Collect about 150-160 ml of the distillate into a measuring flask which contains 10 to 15 ml of water. Transfer the distillate to a separating funnel and extract twice with 25 ml portions of solvent ether. Collect the extract into a conical flask and after a few minutes decant into a porcelain dish taking care not to allow any drop of water to fall in the dish. Concentrate the extract to about 1 ml on a water bath or any alternate heating arrangement the temperature of which shall not exceed 60°C. Spot about 15 μl of the extract on the TLC plate and allow the solvent to evaporate. Place the plates into a

*A suitable grade is 'kieselgel G'.

developing chamber containing the solvent system (benzene-absolute alcohol) (*see* **4.8**) so as to dip the plates about 1 cm. After the solvent mixture has risen to exactly 10 centimetre height, remove the plates and allow the solvent to evaporate. Spray the plates with ammoniacal silver nitrate solution and set aside. Within 10 to 15 minutes brownish spots appear on the plate.

7. IDENTIFICATION OF SPOTS

7.1 Specific greenish brown spots due to *TARAMIRA* appears at R_f 0·1 and 0·9. With lower amount the upper spots at R_f 0·9 sometimes may not appear depending upon the amount of specific sulphur compound present in the oil.

7.2 Common black brown spots due to the allyl-isothiocyanate which is present both in mustard and *TARAMIRA* oils appear at R_f 0·8.

7.3 Some shadow spots at R_f 0·1 to 0·2 may also appear which are not to be taken into account.

8. SENSITIVITY

8.1 This method is sensitive to detect the presence of *TARAMIRA* oil/powder in mustard or rapeseed oil/powder up to an extent of 2 percent. In case the particular variety of seeds contain larger amount of the specific volatile component the method would respond to as low as 1 percent adulteration. The method, however, depends on the isolation of volatile oil by activating the enzyme myrosinase. The solvent extracted *TARAMIRA* oil having no characteristic smell may not respond to this test.

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